

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
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PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Applicant's or agent's file reference

038586-0338001

Date of mailing
(day/month/year)

17 JUN 2008

FOR FURTHER ACTION

See paragraph 2 below

International application No.

PCT/US07/26315

International filing date (day/month/year)

26 December 2007 (26.12.2007)

Priority date (day/month/year)

22 December 2006 (22.12.2006)

International Patent Classification (IPC) or both national classification and IPC

IPC: G01N 33/53(2006.01),33/567(2006.01);A01N 37/18(2006.01);A61K 38/00(2006.01)

USPC: 435/7.1,7.2;514/2

Applicant

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/ US

Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Facsimile No. (571) 273-3201

Date of completion of this opinion

21 May 2008 (21.05.2008)

Authorized officer

/Robert Landsman/

Telephone No. 571-272-1600

WRITTEN OPINION OF THE
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International application No.

PCT/US07/26315

Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of:

- ☒ the international application in the language in which it was filed
☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the rectification of an obvious mistake authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, this opinion has been established on the basis of:

a. type of material

- ☒ a sequence listing
☐ table(s) related to the sequence listing

b. format of material

- ☒ on paper
☒ in electronic form

c. time of filing/furnishing

- ☐ contained in the international application as filed.
☐ filed together with the international application in electronic form.
☒ furnished subsequently to this Authority for the purposes of search.

4. ☒ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

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Box No. V Reasoned statement under Rule 43 bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims <u>Please See Continuation Sheet</u>	YES
	Claims <u>Please See Continuation Sheet</u>	NO
Inventive step (IS)	Claims <u>Please See Continuation Sheet</u>	YES
	Claims <u>Please See Continuation Sheet</u>	NO
Industrial applicability (IA)	Claims <u>Please See Continuation Sheet</u>	YES
	Claims <u>Please See Continuation Sheet</u>	NO

2. Citations and explanations:

Claims 1-5, 7-13, 15-19, 21-25, 27-31, 39, 40 and 42 lack novelty under PCT Article 33(2) as being anticipated by Murray et al. (WO2005072403). The claims recite various methods of increasing the rate of bone formation and fusion by administering a protein comprising SEQ ID NO:11, or a fragment thereof, which would include SEQ ID NO:1. The claims also recite the isolated polypeptides themselves. Murray teach a protein 100% identical to SEQ ID NO:1 (see attached Sequence Comparison). Murray also teaches that this protein can be used with other bone growth factors, including human BMP-2 to induce calcification and osteogenesis (pages 1-6 and Example 2, especially paragraphs [0028], [0029]) and TGF-b ([0032]).

Claims 1-5, 7-13, 15-19, 21-25, 27-31, 39, 40 and 42 lack an inventive step under PCT Article 33(3) as being obvious over Murray (WO2005072403) since the claims lack novelty as discussed above.

Claims 6, 14, 20, 26, 32-38 and 41 meet the criteria set out in PCT Article 33(2)-33(3), because the prior art does not teach, or fairly suggest the claimed polypeptide or nucleic acids.

Claims 1-42 meet the criteria set out in PCT Article 33(4), and thus possess industrial applicability because the subject matter claimed can be made or used in industry.

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Supplemental Box
In case the space in any of the preceding boxes is not sufficient.

V.1. Reasoned Statements:

The opinion as to Novelty was positive (Yes) with respect to claims 6, 14, 20, 26, 32, 35-38, 41

The opinion as to Novelty was negative (No) with respect to claims 1-5, 7-13, 15-19, 21-25, 27-31, 33, 34, 39, 40, 42

The opinion as to Inventive Step was positive (Yes) with respect to claims 6, 14, 20, 26, 32, 35-38, 41

The opinion as to Inventive Step was negative (NO) with respect to claims 1-5, 7-13, 15-19, 21-25, 27-31, 33, 34, 39, 40 and 42

The opinion as to Industrial Applicability was positive (YES) with respect to claims 1-42

The opinion as to Industrial Applicability was negative (NO) with respect to claims NONE